

Dell™ XPS™ 8300 Service Manual

Model: D03M Series

Type: D03M001



Notes, Cautions, and Warnings



NOTE: A NOTE indicates important information that helps you make better use of your computer.




CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.



WARNING: A WARNING indicates a potential for property damage, personal injury, or death.

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Regulatory model: D03M series Regulatory Type: D03M004

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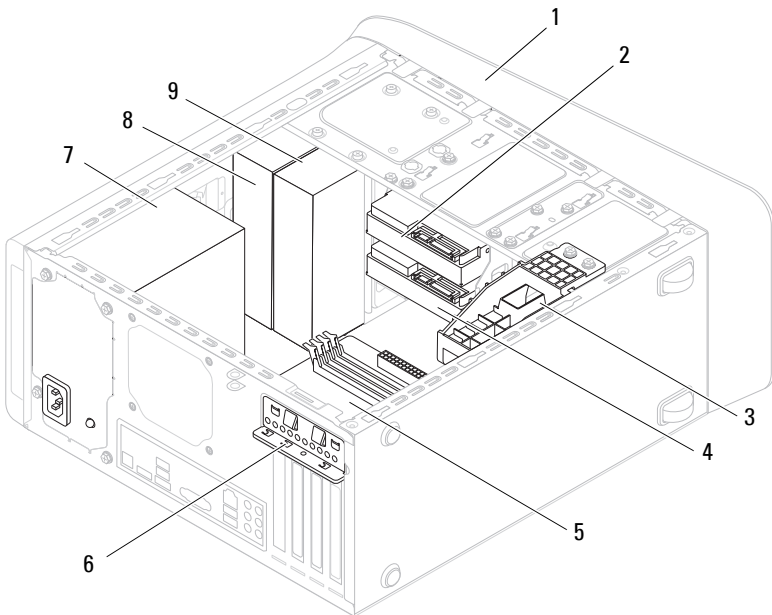
Technical Overview

⚠ WARNING: Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

⚠ WARNING: To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on your computer).

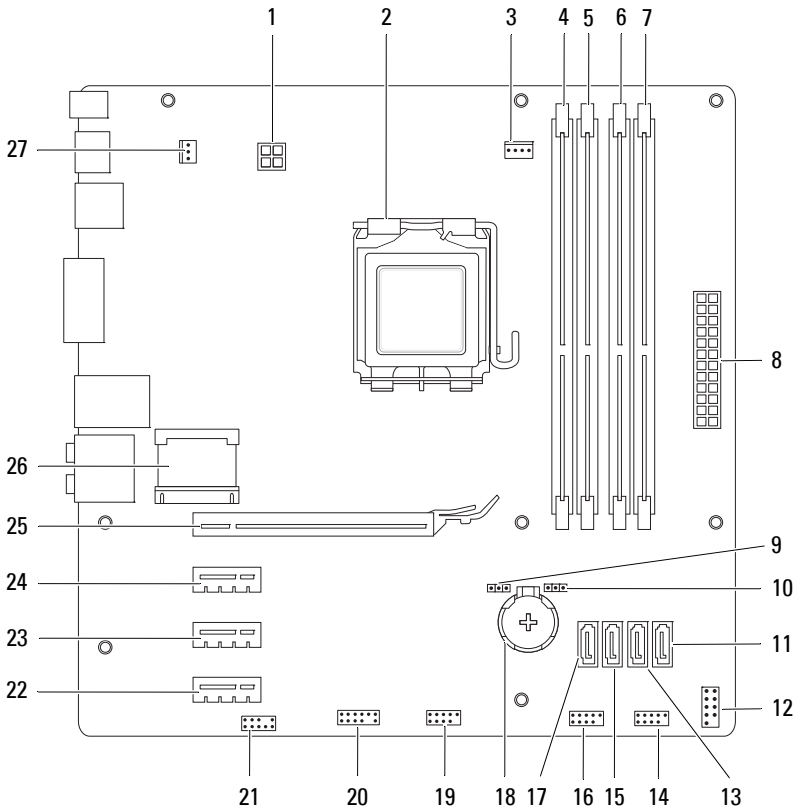
⚠ CAUTION: Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.

Inside View of Your Computer



- | | | | |
|---|----------------------------------|---|-----------------------|
| 1 | front bezel | 2 | primary hard drive |
| 3 | graphics card bracket (optional) | 4 | secondary hard drive |
| 5 | system board | 6 | card retention clamp |
| 7 | power supply | 8 | primary optical drive |
| 9 | secondary optical drive | | |

System Board Components



- | | | | |
|----|--|----|--------------------------------------|
| 1 | power connector (PWR2) | 2 | processor socket |
| 3 | processor fan connector (CPU_FAN) | 4 | memory module connector (DIMM3) |
| 5 | memory module connector (DIMM1) | 6 | memory module connector (DIMM4) |
| 7 | memory module connector (DIMM2) | 8 | main power connector (PWR1) |
| 9 | password reset jumper (PSWD) | 10 | CMOS reset jumper (RTCST) |
| 11 | SATA drive connector (SATA 0) | 12 | power button connector (F_PANEL) |
| 13 | SATA drive connector (SATA 1) | 14 | front panel USB connector (F_USB1) |
| 15 | SATA drive connector (SATA 2) | 16 | front panel USB connector (F_USB3) |
| 17 | SATA drive connector (SATA 3) | 18 | battery socket (BATTERY) |
| 19 | front panel USB connector (F_USB2) | 20 | front panel USB connector (F_USB4) |
| 21 | front panel audio connector (F_AUDIO1) | 22 | PCI Express x1 card slot (PCI-EX1_3) |
| 23 | PCI Express x1 card slot (PCI-EX1_2) | 24 | PCI Express x1 card slot (PCI-EX1_1) |
| 25 | PCI Express x16 card slot (PCI-EX16_1) | 26 | Mini-Card slot (PCIE_MINICARD) |
| 27 | chassis fan connector (SYS_FAN 1) | | |

Before You Begin

This manual provides instructions for removing and installing the components in your computer. Unless otherwise noted, each procedure assumes that the following conditions exist:

- You have performed the steps in "Turning Off Your Computer" on page 13 and "Safety Instructions" on page 14.
- You have read the safety information that shipped with your computer.
- A component can be replaced or—if purchased separately—installed by performing the removal procedure in reverse order.

Technical Specifications

For information on technical specifications of your computer, see the *Setup Guide* at support.dell.com/manuals.

Recommended Tools


The instructions in this document may require the following tools:

- Small flat-blade screwdriver
- Small Phillips screwdriver
- Plastic scribe
- BIOS executable update program available at support.dell.com

Turning Off Your Computer




CAUTION: To avoid losing data, save and close all open files and exit all open programs before you turn off your computer.


- 1 Save and close all open files and exit all open programs.
- 2 To shut down the operating system, click **Start**  and then click **Shut Down**.


- 3 Ensure that the computer is turned off. If your computer did not automatically turn off when you shut down the operating system, press and hold the power button until the computer turns off.


Safety Instructions

Use the following safety guidelines to help protect your computer from potential damage and to help ensure your own personal safety.

 **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

 **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.

 **CAUTION:** When you disconnect a cable, pull on its connector or on its pull-tab, not on the cable itself. Some cables have connectors with locking tabs; if you are disconnecting this type of cable, press in on the locking tabs before you disconnect the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before you connect a cable, ensure that both connectors are correctly oriented and aligned.

 **CAUTION:** To avoid damaging the computer, perform the following steps before you begin working inside the computer.

- 1 Ensure that the work surface is flat and clean to prevent the computer cover from being scratched.
- 2 Turn off your computer (see "Turning Off Your Computer" on page 13) and all attached devices.






 **CAUTION:** To disconnect a network cable, first unplug the cable from your computer and then unplug the cable from the network device.

- 3 Disconnect all telephone or network cables from the computer.
- 4 Disconnect your computer and all attached devices from their electrical outlets.
- 5 Disconnect all attached devices from your computer.
- 6 Press and eject any installed cards from the Media Card Reader.
- 7 Press and hold the power button to ground the system board.



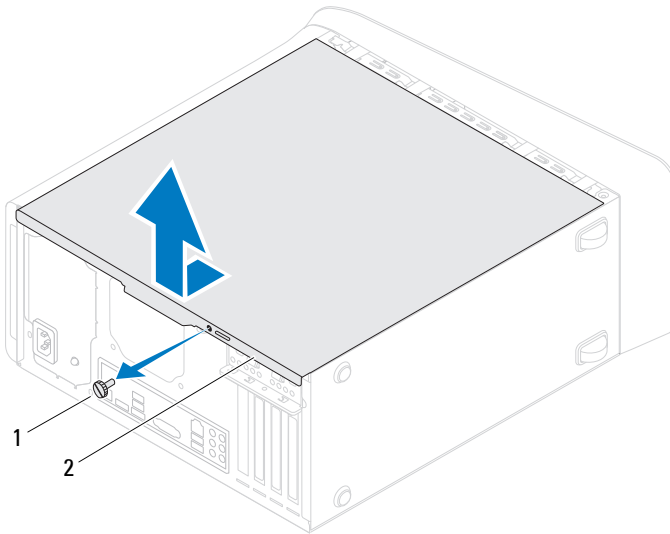
CAUTION: Before touching anything inside your computer, ground yourself by touching an unpainted metal surface, such as the metal at the back of the computer. While you work, periodically touch an unpainted metal surface to dissipate static electricity, which could harm internal components.

Computer Cover

-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.
-  **WARNING:** To guard against likelihood of electric shock, laceration by moving fan blades, or other unexpected injuries, always unplug your computer from the electrical outlet before removing the cover.
-  **WARNING:** Do not operate your computer with any cover(s) (including computer covers, bezels, filler brackets, front-panel inserts, etc.) removed.
-  **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.
-  **CAUTION:** Ensure that sufficient space exists to support the computer with the cover removed—at least 30 cm (1 ft.) of desk top space.

Removing the Computer Cover

- 1 Follow the instructions in "Before You Begin" on page 13.
- 2 Lay the computer on its side with the computer cover facing up.
- 3 Remove the thumbscrew that secures the computer cover to the chassis, using a screw driver, if necessary.
- 4 Release the computer cover by sliding it away from the front of the computer.
- 5 Lift the cover away from the computer and set it aside in a secure location.

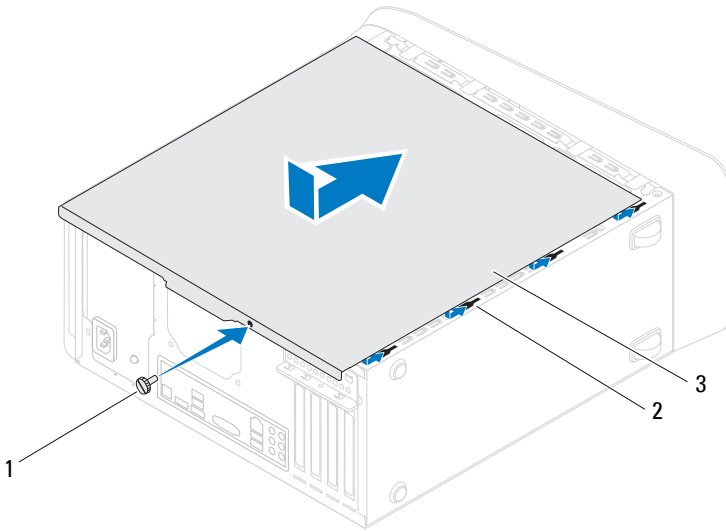


1 thumbscrew

2 computer cover

Replacing the Computer Cover

- 1 Follow the instructions in "Before You Begin" on page 13.
- 2 Connect all the cables and fold the cables out of the way.
- 3 Ensure that no tools or extra parts are left inside the computer.
- 4 Align the tabs at the bottom of the computer cover with the slots located along the edge of the chassis.
- 5 Press the computer cover down and slide it towards the front of the computer.
- 6 Replace the thumbscrew that secures the computer cover to the chassis.







- 1 thumbscrew
- 3 computer cover

2 slots

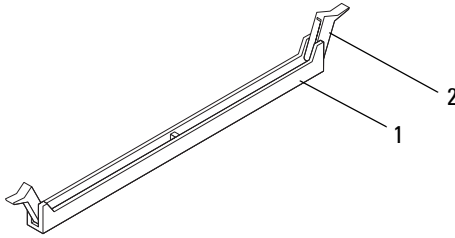
7 Place the computer in an upright position.

Memory Module(s)

-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.
-  **WARNING:** To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.
-  **WARNING:** Do not operate your computer with any cover(s) (including computer covers, bezels, filler brackets, front-panel inserts, etc.) removed.
-  **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.

Removing the Memory Module(s)

- 1 Follow the instructions in "Before You Begin" on page 13.
- 2 Remove the computer cover (see "Removing the Computer Cover" on page 17).
- 3 Locate the memory module(s) on the system board (see "System Board Components" on page 10).
- 4 Press out the securing clip at each end of the memory module connector.



- 1 memory module connector 2 securing clip

- 5 Grasp the memory module and pull it upwards.

If the memory module is difficult to remove, gently ease the memory module back and forth to remove it from the connector.

Replacing the Memory Module(s)

- 1 Follow the instructions in "Before You Begin" on page 13.
- 2 Press out the securing clip at each end of the memory module connector.



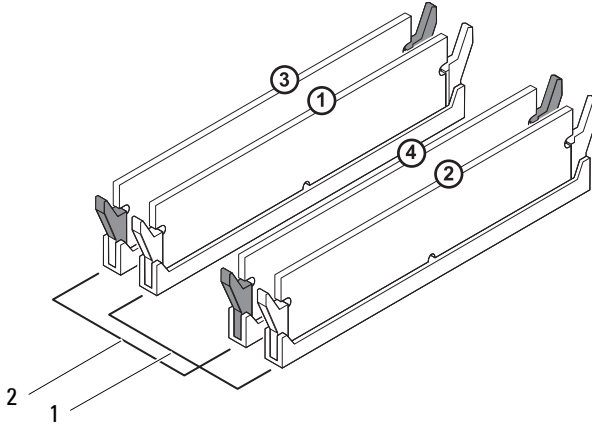
CAUTION: Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.



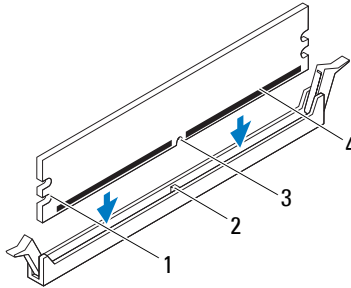
CAUTION: Do not install ECC or DDR3U memory modules.



CAUTION: If you remove the original memory module(s) from your computer during a memory upgrade, keep them separate from any new module(s) that you may have, even if you purchased the new module(s) from Dell. If possible, do not pair an original memory module with a new memory module. Otherwise, your computer may not start properly. The recommended memory configurations are: matched memory module(s) installed in DIMM connectors 1 and 2 and another matched memory module(s) installed in DIMM connectors 3 and 4.



- 1 matched memory modules in DIMM connectors 1 and 2 (white securing clips)
- 2 matched memory modules in DIMM connectors 3 and 4 (black securing clips)
- 3 Align the notch on the bottom of the memory module with the tab in the connector.

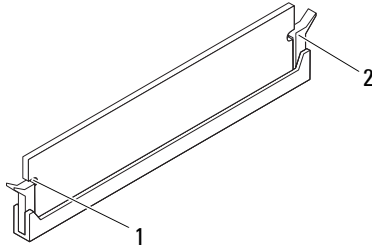


- | | | | |
|---|-------------|---|---------------|
| 1 | cutouts (2) | 2 | tab |
| 3 | notch | 4 | memory module |

△ CAUTION: To avoid damage to the memory module, press the memory module straight down into the connector while you apply equal force to each end of the memory module.

- 4 Insert the memory module into the connector until the memory module snaps into position.

If you insert the memory module correctly, the securing clips snap into the cutouts at each end of the memory module.



1 cutouts (2)





2 securing clip (snapped in position)

- 5** Replace the computer cover (see "Replacing the Computer Cover" on page 18).
- 6** Connect your computer and devices to electrical outlets, and then turn them on.
If a message appears stating that the memory size has changed, press <F1> to continue.
- 7** Log on to your computer.

To verify that the memory is installed correctly, click **Start**  → **Control Panel** → **System**.

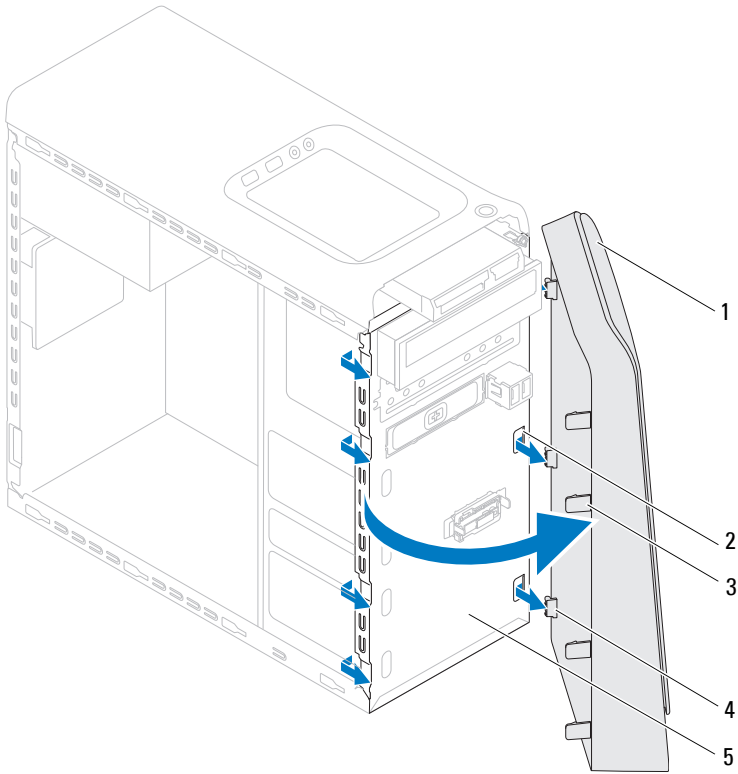
Check the amount of memory (RAM) listed.

Front Bezel

-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.
-  **WARNING:** To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.
-  **WARNING:** Do not operate your computer with any cover(s) (including computer covers, front bezels, filler brackets, front-panel inserts, etc.) removed.
-  **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.

Removing the Front Bezel

- 1 Follow the instructions in "Before You Begin" on page 13.
- 2 Remove the computer cover (see "Removing the Computer Cover" on page 17).
- 3 Place the computer in an upright position.
- 4 Grasp and release the front bezel tabs sequentially, one at a time by moving them outward from the front panel.
- 5 Rotate and pull the front bezel away from the front of the computer to release the front bezel clamps from the front panel slots.

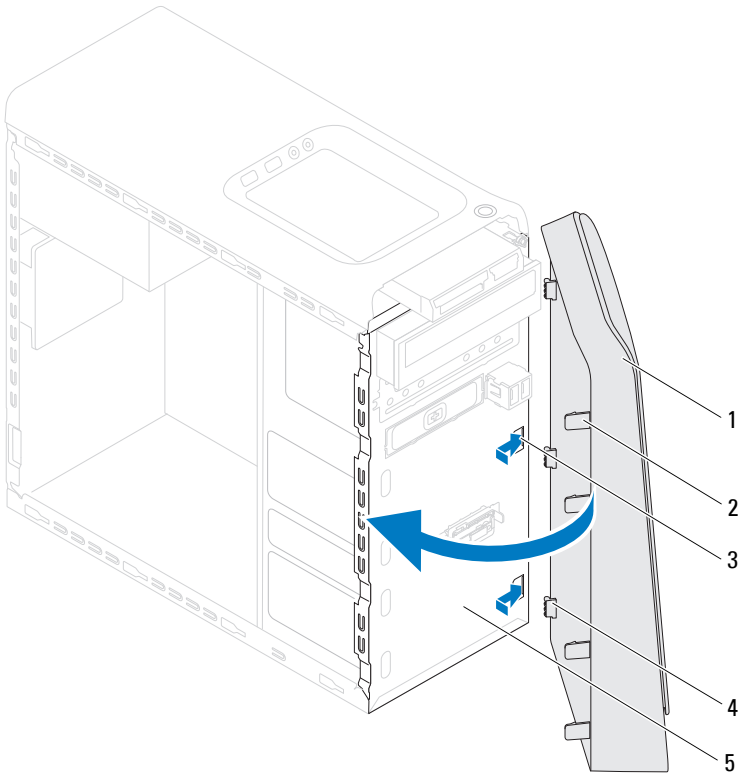


- 1 front bezel
- 2 front panel slots (3)
- 3 front bezel tabs (4)
- 4 front bezel clamps (3)
- 5 front panel

6 Set aside the front bezel in a secure location.


Replacing the Front Bezel


- 1 Follow the instructions in "Before You Begin" on page 13.
- 2 Align and insert the front bezel clamps into the front panel slots.
- 3 Rotate the front bezel towards the computer until the front bezel tabs snap into place.




- 1 front bezel
 - 2 front bezel tabs (4)
 - 3 front panel slots (3)
 - 4 front bezel clamps (3)
 - 5 front panel
- 4 Replace the computer cover (see "Replacing the Computer Cover" on page 18).


Graphics Card Bracket

 **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

 **WARNING:** To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.

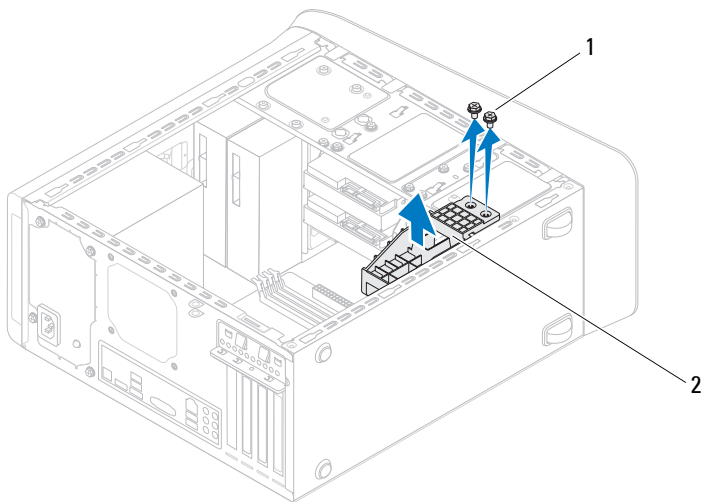
 **WARNING:** Do not operate your computer with any cover(s) (including computer covers, bezels, filler brackets, front-panel inserts, etc.) removed.

 **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.

 **NOTE:** The graphic card bracket is present in your computer only if you ordered a double-width graphics card at the time of purchase.

Removing the Graphics Card Bracket

- 1 Follow the instructions in "Before You Begin" on page 13.
- 2 Remove the computer cover (see "Removing the Computer Cover" on page 17).
- 3 Remove the two screws that secure the graphics card bracket to the chassis.
- 4 Lift the graphics card bracket off the chassis.
- 5 Set the graphics card bracket aside in a secure location.










1 screws (2)

2 graphics card bracket

Replacing the Graphics Card Bracket

- 1 Follow the instructions in "Before You Begin" on page 13.
- 2 Align the screw holes on the graphics card bracket with the screw holes on chassis.
- 3 Replace the two screws that secure the graphics card bracket to the chassis.
- 4 Replace the computer cover (see "Replacing the Computer Cover" on page 18).

Wireless Mini-Card

-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.
-  **WARNING:** To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.
-  **WARNING:** Do not operate your computer with any cover(s) (including computer covers, bezels, filler brackets, front-panel inserts, etc.) removed.
-  **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.
-  **CAUTION:** To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on your computer).
-  **CAUTION:** When the Mini-Card is not in the computer, store it in protective antistatic packaging (see "Protecting Against Electrostatic Discharge" in the safety instructions that shipped with your computer).
-  **NOTE:** Dell does not guarantee compatibility or provide support for Mini-Cards from sources other than Dell.

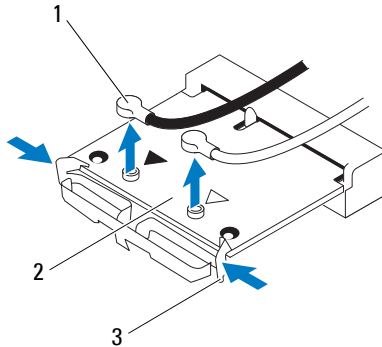
If you ordered a wireless Mini-Card with your computer, the card is already installed.

Your computer supports one half Mini-Card slot for Wireless Local Area Network (WLAN).

Removing the Mini-Card

- 1 Follow the instructions in "Before You Begin" on page 13.

- 2 Remove the computer cover (see "Removing the Computer Cover" on page 17).
- 3 Disconnect the antenna cable(s) from the Mini-Card.



- | | | | |
|---|--------------------|---|-----------|
| 1 | antenna cables (2) | 2 | Mini-Card |
| 3 | clips (2) | | |

- 4 Release the Mini-Card by pressing the clips on either side of the card.
- 5 Lift the Mini-Card away from the system-board connector.





CAUTION: When the Mini-Card is not in the computer, store it in protective antistatic packaging (see "Protecting Against Electrostatic Discharge" in the safety instructions that shipped with your computer).

Replacing the Mini-Card

- CAUTION:** The connectors are keyed to ensure correct insertion. Use of excessive force may damage the connectors.
- CAUTION:** To avoid damage to the Mini-Card, ensure that there are no cables or antenna cables under the Mini-Card.

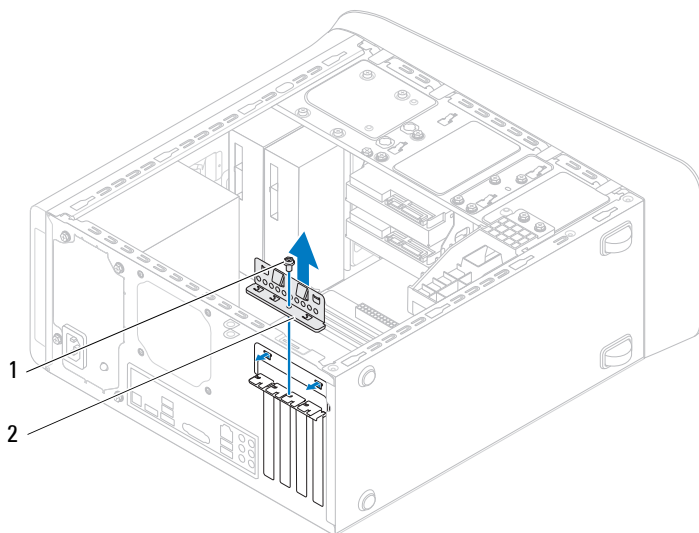
- 1** Follow the instructions in "Before You Begin" on page 13.
- 2** Align the notch on the Mini-Card with the tab in the system-board connector.
- 3** Insert the Mini-Card at a 45-degree angle into the system-board connector.
- 4** Press the other end of the Mini-Card down until it clicks into place. If you do not hear the click, remove the Mini-Card and reinstall it.
- 5** Connect the appropriate antenna cables to the WLAN card you are installing. The WLAN card has two triangles marked on the label (black and white):
 - Connect the black cable to the connector marked with a black triangle.
 - Connect the white cable to the connector marked with a white triangle.
- 6** Replace the computer cover (see "Replacing the Computer Cover" on page 18).
- 7** Reconnect the computer and devices to electrical outlets, and then turn them on.

PCI Express Cards

-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.
-  **WARNING:** To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.
-  **WARNING:** Do not operate your computer with any cover(s) (including computer covers, bezels, filler brackets, front-panel inserts, etc.) removed.
-  **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.

Removing the Card Retention Bracket

- 1 Follow the instructions in "Before You Begin" on page 13.
- 2 Remove the computer cover (see "Removing the Computer Cover" on page 17).
- 3 Remove the screw that secures the card retention bracket.
- 4 Lift the card retention bracket and set it aside in a secure location.

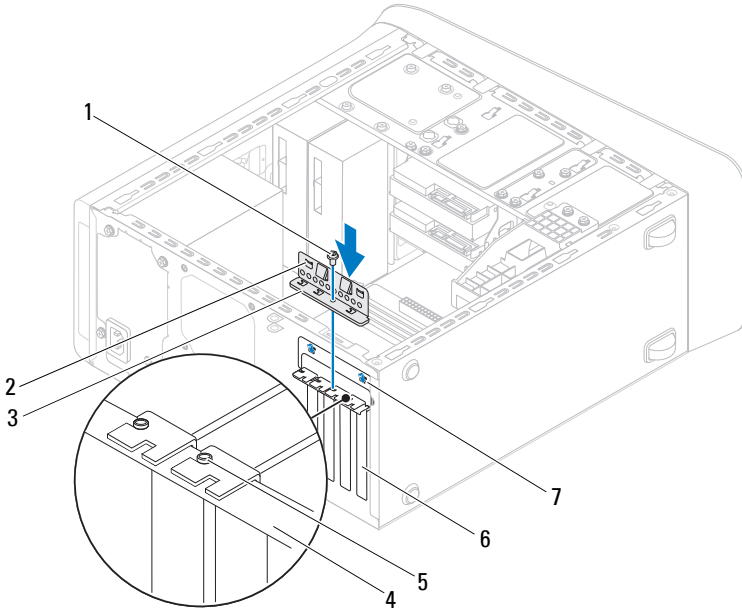


1 screw

2 card retention bracket

Replacing the Card Retention Bracket

- 1 Follow the instructions in "Before You Begin" on page 13.
- 2 Replace the card retention bracket, ensuring that:
 - The guide clamp is aligned with the guide notch.
 - The top of all cards and filler brackets are flush with the alignment bar.
 - The notch on top of the card or filler bracket fits around the alignment guide.
- 3 Replace the screw that secures the card retention bracket.
- 4 Replace the computer cover (see "Replacing the Computer Cover" on page 18).

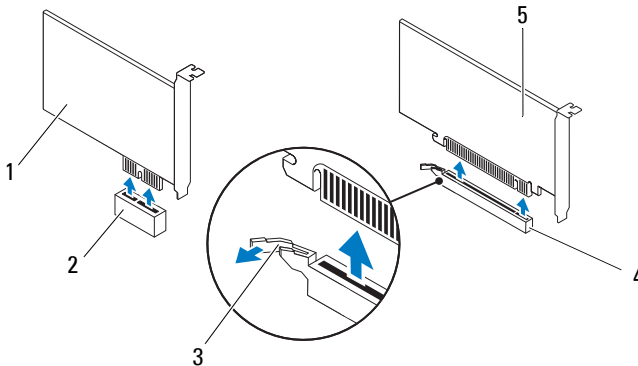


- | | | | |
|---|------------------------|---|------------------|
| 1 | screw | 2 | guide clamps (2) |
| 3 | card retention bracket | 4 | alignment bar |
| 5 | alignment guide | 6 | filler bracket |
| 7 | guide notches (2) | | |

Removing PCI Express Cards


- 1 Follow the instructions in "Before You Begin" on page 13.
- 2 Remove the computer cover (see "Removing the Computer Cover" on page 17).

- 3** Remove the graphics card bracket, if applicable (see "Removing the Graphics Card Bracket" on page 31).
- 4** Remove the card retention bracket (see "Removing the Card Retention Bracket" on page 37).
- 5** Disconnect any cables connected to the card, if applicable.
- 6** Remove the PCI Express card from the card slot:
 - For a PCI Express x1 card, grasp the card by its top corners, and ease it out of its connector.
 - For a PCI Express x16 card, push the securing tab, grasp the card by its top corners, and then ease it out of its connector.



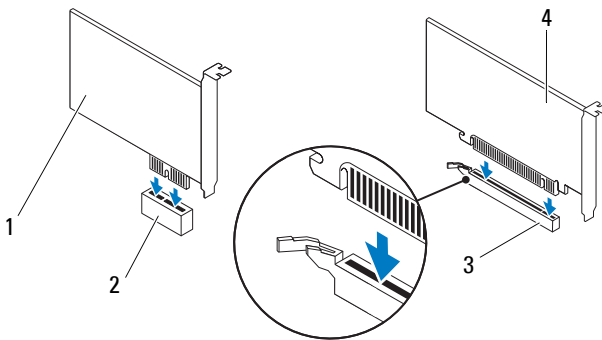
- | | | | |
|---|----------------------|---|---------------------------|
| 1 | PCI Express x1 card | 2 | PCI Express x1 card slot |
| 3 | securing tab | 4 | PCI Express x16 card slot |
| 5 | PCI Express x16 card | | |

- 7 If you are removing the card permanently, install a filler bracket in the empty card-slot opening.

 **NOTE:** Installing filler brackets over empty card-slot openings is necessary to maintain FCC certification of the computer. The brackets also keep dust and dirt out of your computer.

Replacing PCI Express Cards

- 1 Follow the instructions in "Before You Begin" on page 13.
- 2 Prepare the card for installation.
See the documentation that shipped with the card for information on configuring the card, making internal connections, or otherwise customizing it for your computer.
- 3 Place the PCI Express card in the slot on the system board and press down firmly. Ensure that the PCI Express card is fully seated in the slot.



- | | | | |
|---|---------------------------|---|--------------------------|
| 1 | PCI Express x1 card | 2 | PCI Express x1 card slot |
| 3 | PCI Express x16 card slot | 4 | PCI Express x16 card |

- 4 Replace the card retention bracket (see "Replacing the Card Retention Bracket" on page 38).

- 5 Connect any cables that should be attached to the card.

See the documentation that shipped with the card for information about the card's cable connections.



CAUTION: Do not route card cables over or behind the cards. Cables routed over the cards can prevent the computer cover from closing properly or cause damage to the equipment.

- 6 Replace the graphics card bracket, if applicable (see "Replacing the Graphics Card Bracket" on page 32).
- 7 Replace the computer cover (see "Replacing the Computer Cover" on page 18).
- 8 Reconnect the computer and devices to electrical outlets, and then turn them on.
- 9 To complete the installation, see "Configuring Your Computer After Removing or Installing the PCI Express Card" on page 42.





Configuring Your Computer After Removing or Installing the PCI Express Card



NOTE: For information about the location of external connectors, see the *Setup Guide*. For information on installing drivers and software for your card, see the documentation that shipped with the card.




	Installed	Removed
Sound card	<ol style="list-style-type: none"> 1 Enter system setup (see "System Setup Utility" on page 103) 2 Go to Onboard Audio Controller and then change the setting to Disabled. 3 Connect the external audio devices to the sound card's connectors. 	<ol style="list-style-type: none"> 1 Enter system setup (see "System Setup Utility" on page 103) 2 Go to Onboard Audio Controller and then change the setting to Enabled. 3 Connect the external audio devices to the computer's back panel connectors.
Network card	<ol style="list-style-type: none"> 1 Enter system setup (see "System Setup Utility" on page 103) 2 Go to Onboard LAN Controller and then change the setting to Disabled. 3 Connect the network cable to the network card's connector. 	<ol style="list-style-type: none"> 1 Enter system setup (see "System Setup Utility" on page 103) 2 Go to Onboard LAN Controller and then change the setting to Enabled. 3 Connect the network cable to the integrated network connector.

Drives

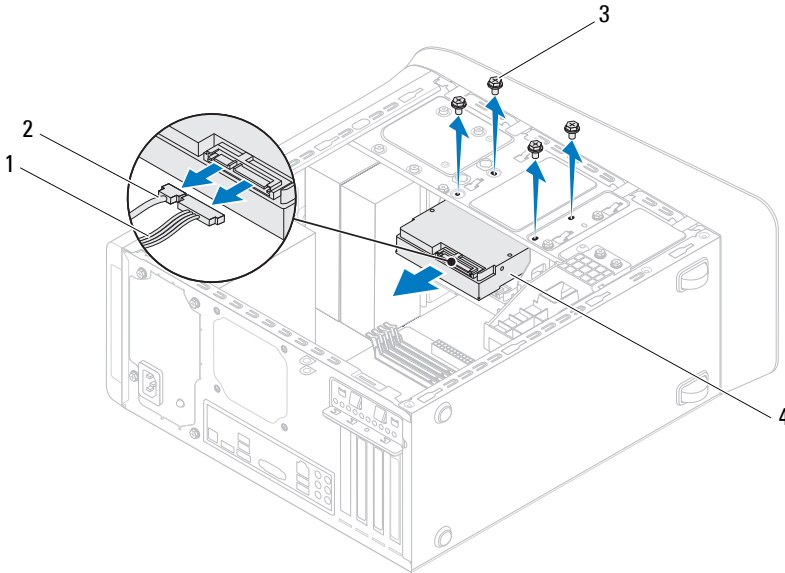
-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.
-  **WARNING:** To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.
-  **WARNING:** Do not operate your computer with any cover(s) (including computer covers, bezels, filler brackets, front-panel inserts, etc.) removed.
-  **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.

Hard Drive

Removing the Primary Hard Drive

-  **CAUTION:** If you are replacing a hard drive that contains data you want to keep, back up your files before you begin this procedure.
- 1 Follow the instructions in "Before You Begin" on page 13.
 - 2 Remove the computer cover (see "Removing the Computer Cover" on page 17).
 - 3 Disconnect the power and data cables from the hard drive.
 -  **NOTE:** If you are not replacing the hard drive at this time, disconnect the other end of the data cable from the system board connector and set it aside. You can use the data cable to install a hard drive at a later time.
 - 4 Remove the four screws that secure the hard drive to the chassis.
-  **CAUTION:** Ensure that you do not scratch the hard drive's circuit board, while removing or replacing the hard drive.

5 Slide the hard drive out towards the back of the computer.



1 power cable

2 data cable

3 screws (4)

4 primary hard drive

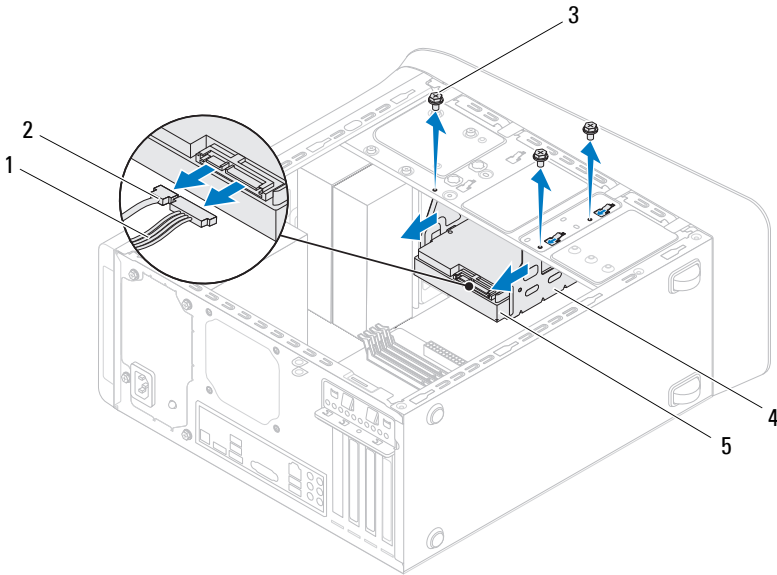
6 If removing the hard drive changes the drive configuration, ensure that you reflect these changes in the system setup (see "System Setup Utility" on page 103).

Removing the Hard Drive Cage

1 Follow the instructions in "Before You Begin" on page 13.

2 Remove the computer cover (see "Removing the Computer Cover" on page 17).

- 3 Remove the primary hard drive (see "Removing the Primary Hard Drive" on page 45).
- 4 Remove the three screws that secure the hard drive cage to the chassis.
- 5 If applicable, disconnect the power and data cables from the secondary hard drive (see "System Board Components" on page 10).
- 6 Slide the hard drive cage towards the back of the chassis.

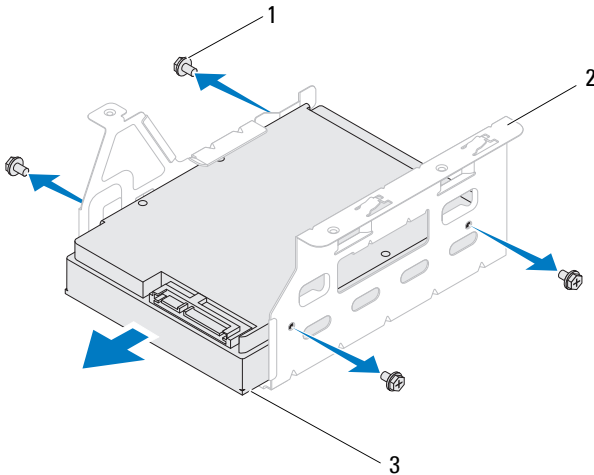


- | | | | |
|---|----------------------|---|-----------------|
| 1 | power cable | 2 | data cable |
| 3 | screws (3) | 4 | hard drive cage |
| 5 | secondary hard drive | | |

Removing the Secondary Hard Drive

- 1 Follow the instructions in "Before You Begin" on page 13.

- 2 Remove the computer cover (see "Removing the Computer Cover" on page 17).
- 3 Remove the primary hard drive (see "Removing the Primary Hard Drive" on page 45).
- 4 Remove the hard drive cage (see "Removing the Hard Drive Cage" on page 46).
- 5 Remove the four screws that secure the secondary hard drive to the hard drive cage.
- 6 Slide the secondary hard drive away from the hard drive cage.



1 screws (4)

2 hard drive cage

3 secondary hard drive

Replacing the Secondary Hard Drive

- 1 Follow the instructions in "Before You Begin" on page 13.

- 2 Check the documentation that shipped with the hard drive to verify that it is configured for your computer.
- 3 Slide the secondary hard drive into the hard drive cage.
- 4 Align the screw holes on the secondary hard drive with the screw holes on the hard drive cage.
- 5 Replace the four screws that secure the secondary hard drive to the hard drive cage.

Replacing the Hard Drive Cage

- 1 Follow the instructions in "Before You Begin" on page 13.
- 2 Align the screw holes on the hard drive cage with the screw holes on the chassis.
- 3 Replace the three screws that secure the hard drive cage to the chassis.
- 4 If applicable, connect the power and data cables to the secondary hard drive (see "System Board Components" on page 10).

Replacing the Primary Hard Drive

- 1 Follow the instructions in "Before You Begin" on page 13.
- 2 Check the documentation that shipped with the drive to verify that it is configured for your computer.
- 3 Slide the primary hard drive into the hard drive cage.
- 4 Align the screw holes on the primary hard drive with the screw holes on the chassis.
- 5 Replace the four screws that secure the primary hard drive to the chassis.
- 6 Connect the power and data cables to the primary hard drive (see "System Board Components" on page 10).
- 7 Replace the computer cover (see "Replacing the Computer Cover" on page 18).
- 8 Connect your computer and devices to electrical outlets, and then turn them on.
- 9 See the documentation that shipped with the hard drive for instructions on installing any software required for drive operation.

- 10 Check the System Setup for drive configuration changes (see "System Setup Utility" on page 103).

Optical Drive

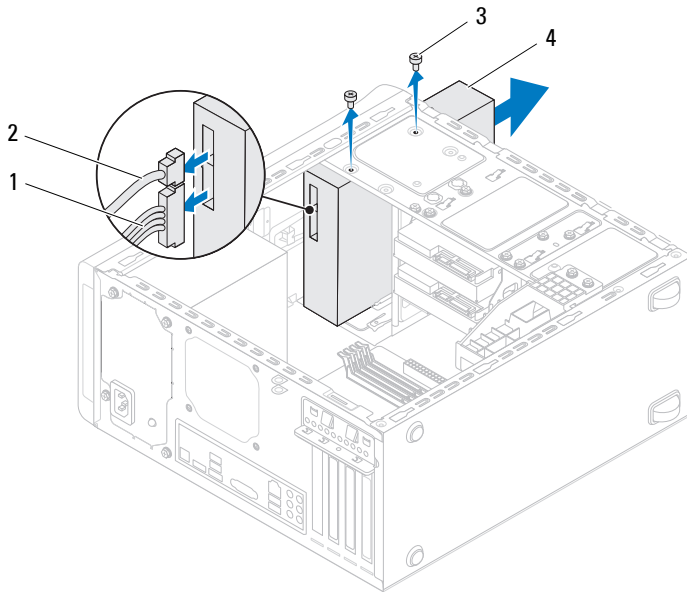
Removing the Optical Drive

- 1 Follow the instructions in "Before You Begin" on page 13.
- 2 Remove the computer cover (see "Removing the Computer Cover" on page 17).
- 3 Remove the front bezel (see "Removing the Front Bezel" on page 27).
- 4 Disconnect the power and data cables from the optical drive.



NOTE: If you are not replacing the optical drive at this time, disconnect the other end of the data cable from the system board connector and set it aside. You can use the data cable to install an optical drive at a later time.

- 5 Remove the two screws that secure the optical drive to the chassis.
- 6 Push and slide the optical drive out through the front of the computer.

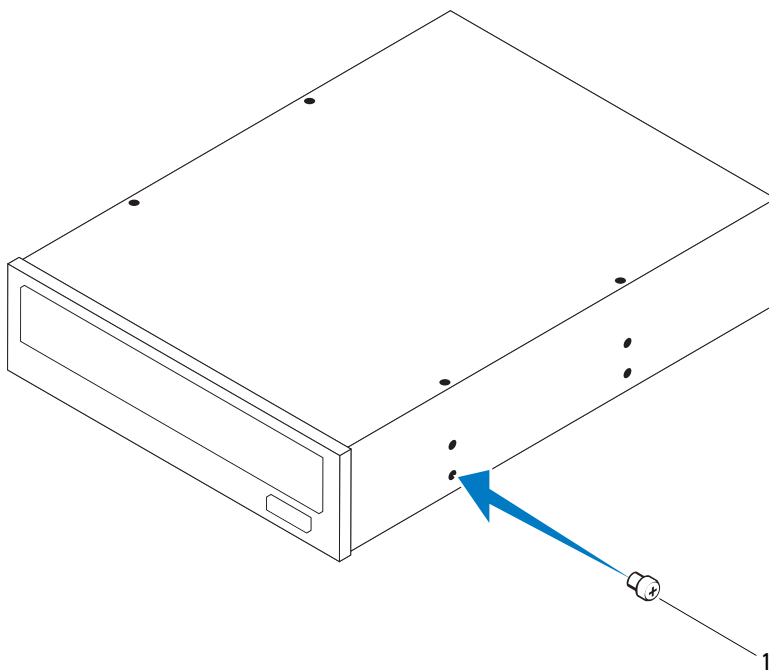


- | | | | |
|---|-------------|---|---------------|
| 1 | power cable | 2 | data cable |
| 3 | screws (2) | 4 | optical drive |

7 Set aside the optical drive in a secure location.

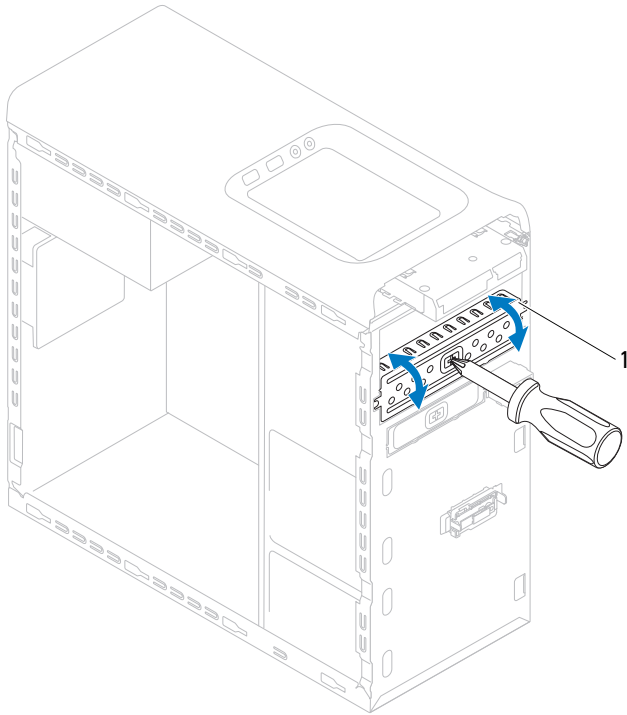
Replacing the Optical Drive

- 1** Follow the instructions in "Before You Begin" on page 13.
- 2** Remove the screw from the old optical drive and insert it in the new optical drive.



1 screw

- 3** To install a secondary optical drive, insert a screw driver and twist it to remove the break-away metal plate.
- 4** Pull the break-away metal plate away from the chassis.



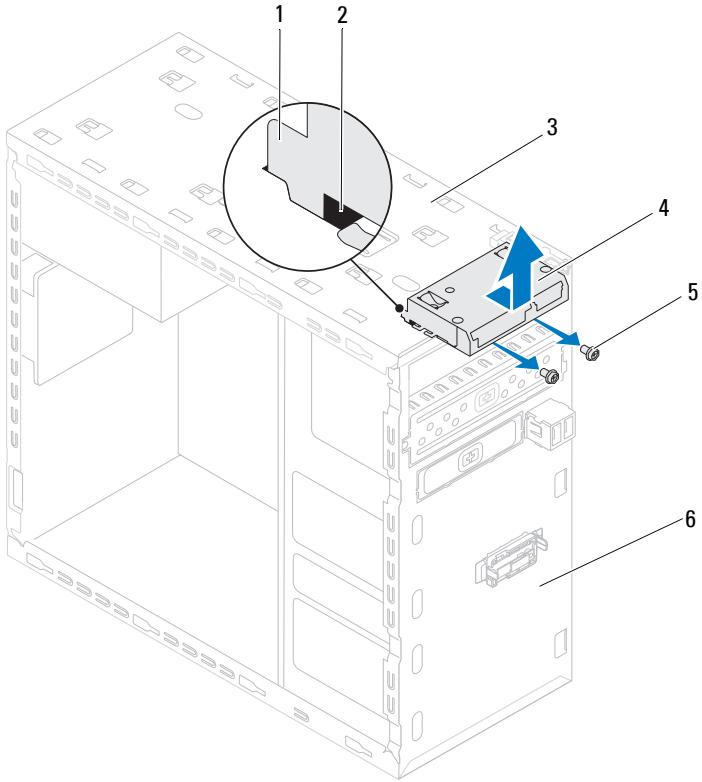
- 1 break-away metal plate
- 5 Gently slide the optical drive into the optical drive bay through the front of the computer.
- 6 Align the screw holes on the optical drive with the screw holes on the chassis.
- 7 Replace the two screws that secure the optical drive to the chassis.

- 8** Connect the power and data cables to the optical drive (see "System Board Components" on page 10).
- 9** Replace the front bezel (see "Replacing the Front Bezel" on page 29).
- 10** Replace the computer cover (see "Replacing the Computer Cover" on page 18).
- 11** Connect your computer and devices to electrical outlets, and turn them on.
- 12** See the documentation that shipped with the drive for instructions on installing any software required for drive operation.
- 13** Check the System Setup for drive configuration changes (see "System Setup Utility" on page 103).

Media Card Reader

Removing the Media Card Reader

- 1** Follow the instructions in "Before You Begin" on page 13.
- 2** Remove the computer cover (see "Removing the Computer Cover" on page 17).
- 3** Remove the front bezel (see "Removing the Front Bezel" on page 27).
- 4** Remove the optical drive (see "Removing the Optical Drive" on page 50).
- 5** Remove the top cover (see "Removing the Top Cover" on page 57).
- 6** Remove the two screws that secure the Media Card Reader to the front panel. The screws are located below the Media Card Reader.
- 7** Disconnect the Media Card Reader cable from the system board connector F_USB1 (see "System Board Components" on page 10).
- 8** Slide and lift the Media Card Reader to remove it from the top panel.







- 1 Media Card Reader guides (2)
- 3 top panel
- 5 screws (2)

- 2 slots (2)
- 4 Media Card Reader
- 6 front panel

Replacing the Media Card Reader

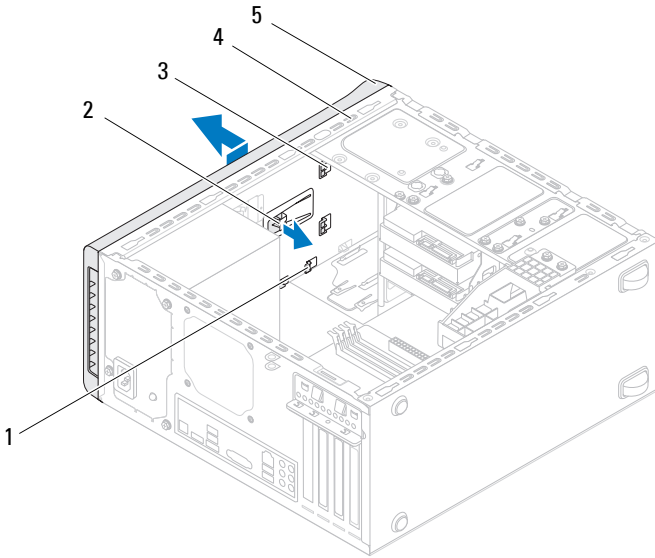
- 1 Follow the instructions in "Before You Begin" on page 13.
- 2 Gently slide the Media Card Reader guides into the slots in the top panel.
- 3 Replace the two screws that secure the Media Card Reader to the front panel.
- 4 Connect the Media Card Reader cable to the system board connector F_USB1 (see "System Board Components" on page 10).
- 5 Replace the top cover (see "Replacing the Top Cover" on page 59).
- 6 Replace the optical drive (see "Replacing the Optical Drive" on page 51).
- 7 Replace the front bezel (see "Replacing the Front Bezel" on page 29).
- 8 Replace the computer cover (see "Replacing the Computer Cover" on page 18).
- 9 Connect your computer and devices to electrical outlets, and then turn them on.

Top Cover

-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.
-  **WARNING:** To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.
-  **WARNING:** Do not operate your computer with any cover(s) (including computer covers, bezels, filler brackets, front-panel inserts, etc.) removed.
-  **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.

Removing the Top Cover

- 1 Follow the instructions in "Before You Begin" on page 13.
- 2 Remove the computer cover (see "Removing the Computer Cover" on page 17).
- 3 Remove the front bezel (see "Removing the Front Bezel" on page 27).
- 4 Remove the optical drive (see "Removing the Optical Drive" on page 50).
- 5 Pull the release tab, and slide the top cover towards the front of the computer to release the top cover tabs from the slots on the top panel.
- 6 Pull the top cover away from the top panel.







- | | | | |
|---|----------------|---|-------------|
| 1 | slots | 2 | release tab |
| 3 | top cover tabs | 4 | top panel |
| 5 | top cover | | |

7 Set the top cover aside in a secure location.


Replacing the Top Cover

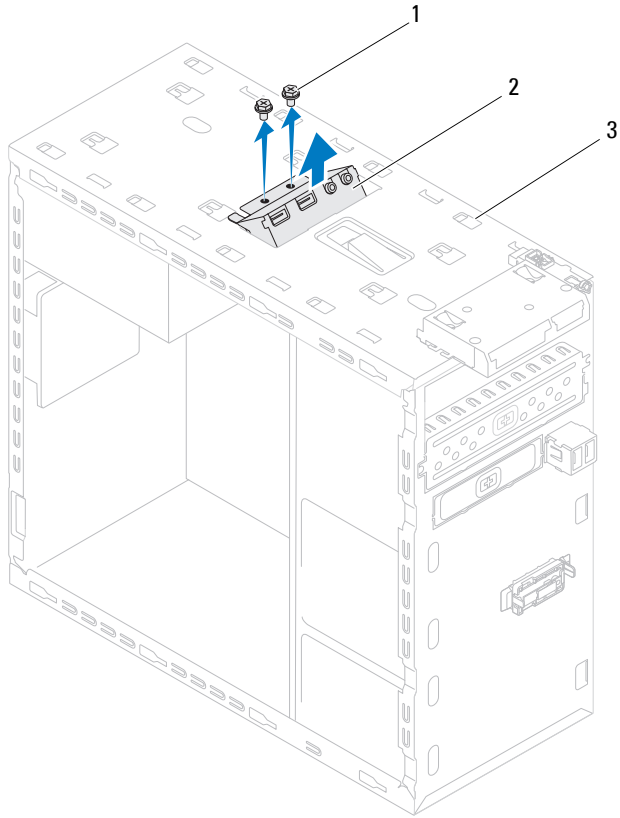
- 1** Follow the instructions in "Before You Begin" on page 13.
- 2** Align the tabs on the top cover with the slots on the top panel.
- 3** Press and slide the top cover towards the back of the computer, until it clicks into place.
- 4** Replace the optical drive (see "Replacing the Optical Drive" on page 51).
- 5** Replace the front bezel (see "Replacing the Front Bezel" on page 29).
- 6** Replace the computer cover (see "Replacing the Computer Cover" on page 18).

Top I/O Panel

-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.
-  **WARNING:** To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.
-  **WARNING:** Do not operate your computer with any cover(s) (including computer covers, bezels, filler brackets, front-panel inserts, etc.) removed.
-  **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.

Removing the Top I/O Panel

-  **NOTE:** Make note of the routing of all cables as you remove them so that you can re-route them correctly when installing the new top I/O panel.
- 1 Follow the instructions in "Before You Begin" on page 13.
 - 2 Remove the computer cover (see "Removing the Computer Cover" on page 17).
 - 3 Remove the front bezel (see "Removing the Front Bezel" on page 27).
 - 4 Remove the optical drive (see "Removing the Optical Drive" on page 50).
 - 5 Remove the top cover (see "Removing the Top Cover" on page 57).
 - 6 Disconnect the top I/O panel cables from the system board connectors, F_USB3 and F_AUDIO1 (see "System Board Components" on page 10).
 - 7 Remove the two screws that secure the top I/O panel to the top panel.



- 1 screws (2)
- 3 top panel


2 top I/O panel


8 Carefully remove the top I/O panel from the top panel.

Replacing the Top I/O Panel


- 1** Follow the instructions in "Before You Begin" on page 13.
- 2** Align the screw holes on the top I/O panel with the screw holes on the top panel.
- 3** Replace the two screws that secure the top I/O panel to the top panel.
- 4** Connect the top I/O panel cables to the system board connectors, F_USB3 and F_AUDIO1 (see "System Board Components" on page 10).
- 5** Replace the top cover (see "Replacing the Top Cover" on page 59).
- 6** Replace the optical drive (see "Replacing the Optical Drive" on page 51).
- 7** Replace the front bezel (see "Replacing the Front Bezel" on page 29).
- 8** Replace the computer cover (see "Replacing the Computer Cover" on page 18).
- 9** Connect your computer and devices to electrical outlets, and turn them on.

Front USB Panel


 **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.

 **WARNING:** To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.

 **WARNING:** Do not operate your computer with any cover(s) (including computer covers, bezels, filler brackets, front-panel inserts, etc.) removed.

 **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.

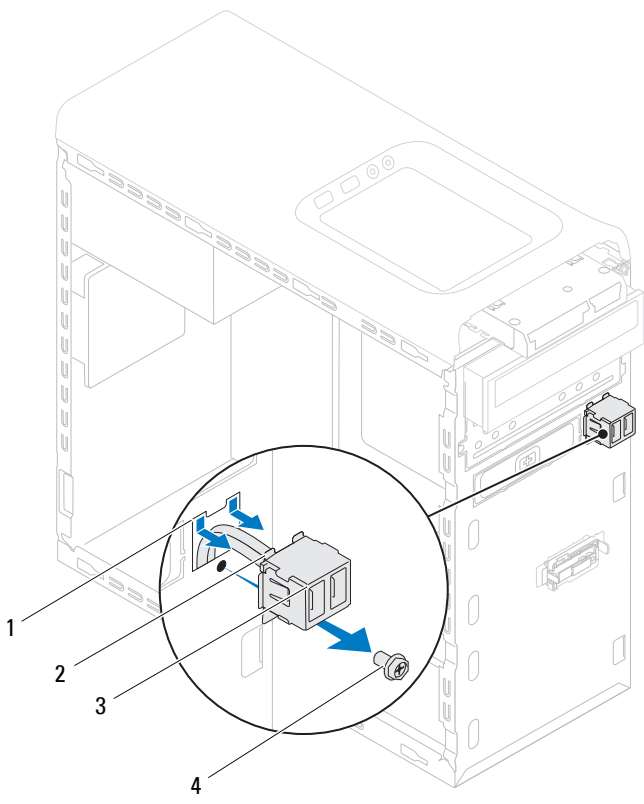
Removing the Front USB Panel

 **NOTE:** Make note of the routing of all cables as you remove them so that you can re-route them correctly when installing the new front USB panel.

- 1 Follow the instructions in "Before You Begin" on page 13.
- 2 Remove the computer cover (see "Removing the Computer Cover" on page 17).
- 3 Remove the front bezel (see "Removing the Front Bezel" on page 27).

 **CAUTION:** When sliding the front USB panel out of the computer, be extremely careful. Carelessness may result in damage to the cable connectors and the cable routing clips.

- 4 Disconnect the front USB panel cables from the system board connector F_USB2 (see "System Board Components" on page 10).
- 5 Remove the screw that secures the front USB panel to the front panel.
- 6 Slide the front USB panel down to release the clamps from the front panel and pull it away.



- | | | | |
|---|----------------------------|---|------------|
| 1 | front USB panel clamp slot | 2 | clamps (2) |
| 3 | front USB panel | 4 | screw |





Replacing the Front USB Panel



CAUTION: To avoid damage to the cable connectors and the cable routing clips, carefully slide the front USB panel into the front USB panel clamp slot.

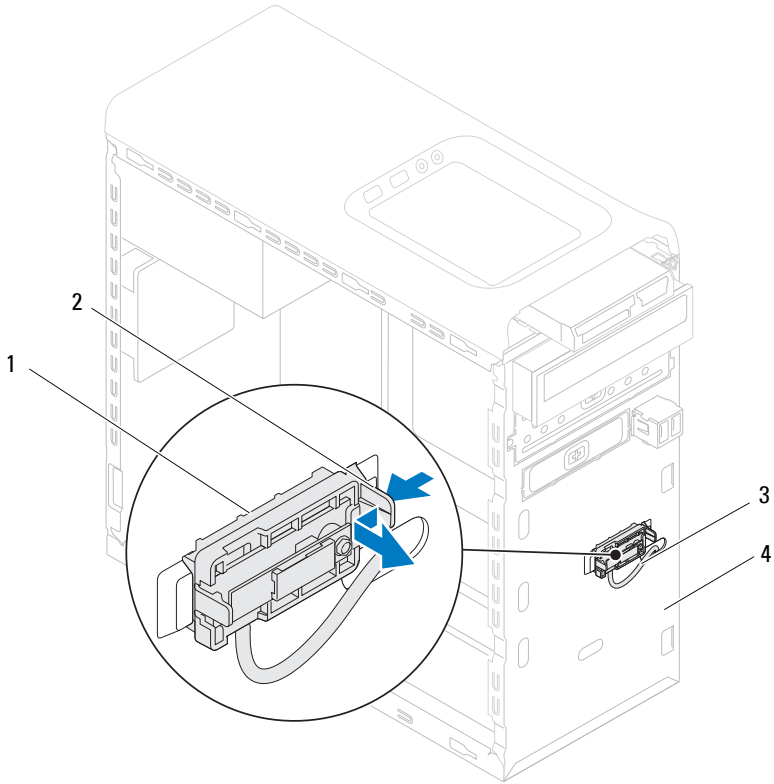
- 1 Follow the instructions in "Before You Begin" on page 13.
- 2 Align and slide the front USB panel clamps into the front USB panel clamp slot.
- 3 Replace the screw that secures the front USB panel to the front panel.
- 4 Connect the front USB panel cables to the system board connector F_USB2 (see "System Board Components" on page 10).
- 5 Replace the front bezel (see "Replacing the Front Bezel" on page 29).
- 6 Replace the computer cover (see "Replacing the Computer Cover" on page 18).
- 7 Connect your computer and devices to electrical outlets, and turn them on.

Bluetooth Assembly

-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.
-  **WARNING:** To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.
-  **WARNING:** Do not operate your computer with any cover(s) (including computer covers, bezels, filler brackets, front-panel inserts, etc.) removed.
-  **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.

Removing the Bluetooth Assembly

- 1 Follow the instructions in "Before You Begin" on page 13.
- 2 Remove the computer cover (see "Removing the Computer Cover" on page 17).
- 3 Remove the front bezel (see "Removing the Front Bezel" on page 27).
- 4 Disconnect the Bluetooth assembly cable from the system board connector F_USB4 (see "System Board Components" on page 10).
- 5 Press in on the tab as shown in the illustration and pull the Bluetooth assembly away from the front panel.
- 6 Carefully slide and remove the Bluetooth assembly cable through the slot in the front panel.







- 1 Bluetooth assembly
- 2 Bluetooth assembly tab
- 3 Bluetooth assembly cable
- 4 front panel

7 Set the Bluetooth assembly aside in a secure location.

Replacing the Bluetooth Assembly

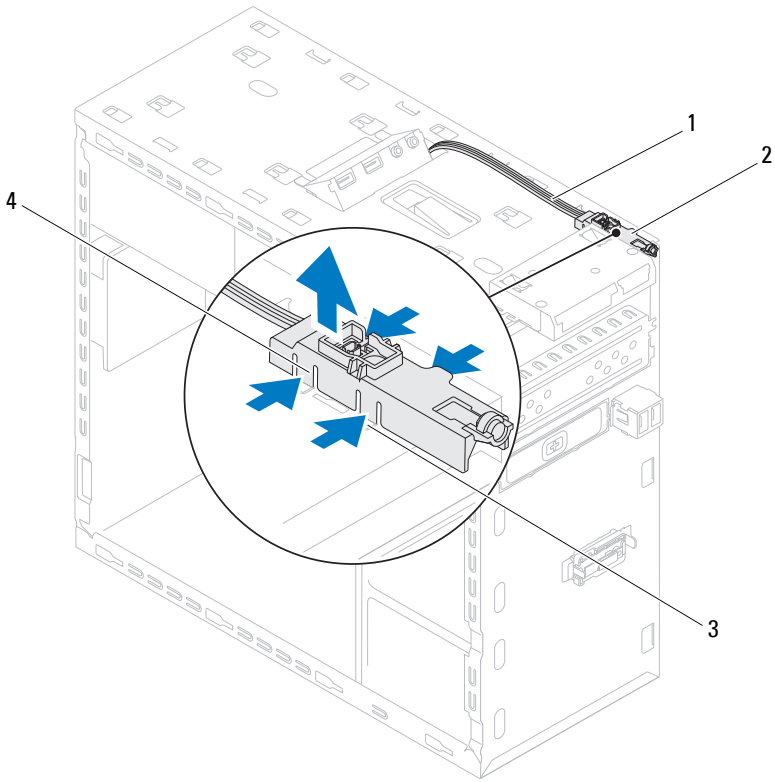
- 1** Follow the instructions in "Before You Begin" on page 13.
- 2** Slide the Bluetooth assembly cable through the slot on the front panel.
- 3** Align the Bluetooth assembly tab with the Bluetooth assembly slot in the front panel.
- 4** Press in on the Bluetooth assembly tab, and push it towards the front panel until it clicks into place.
- 5** Connect the Bluetooth assembly cable to the system board connector, F_USB4 (see "System Board Components" on page 10).
- 6** Replace the front bezel (see "Replacing the Front Bezel" on page 29).
- 7** Replace the computer cover (see "Replacing the Computer Cover" on page 18).
- 8** Connect your computer and devices to electrical outlets, and turn them on.

Power Button Module

-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.
-  **WARNING:** To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.
-  **WARNING:** Do not operate your computer with any cover(s) (including computer covers, bezels, filler brackets, front-panel inserts, etc.) removed.
-  **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.

Removing the Power Button Module

- 1 Follow the instructions in "Before You Begin" on page 13.
- 2 Remove the computer cover (see "Removing the Computer Cover" on page 17).
- 3 Remove the front bezel (see "Removing the Front Bezel" on page 27).
- 4 Remove the optical drive (see "Removing the Optical Drive" on page 50).
- 5 Remove the top cover (see "Removing the Top Cover" on page 57).
- 6 Disconnect the power button module cable from the system board connector, F_PANEL (see "System Board Components" on page 10).
- 7 Press the power button module tabs and lift the power button module to release it from the top panel.



1 cable

2 power button module

3 slot





4 power button module tabs (4)

8 Set the power button module aside in a secure location.

Replacing the Power Button Module


- 1** Follow the instructions in "Before You Begin" on page 13.
- 2** Align and push the power button module tabs into the slots on the top panel.
- 3** Connect the power button module cable to the system board connector, F_PANEL (see "System Board Components" on page 10).
- 4** Replace the top cover (see "Replacing the Top Cover" on page 59).
- 5** Replace the optical drive (see "Replacing the Optical Drive" on page 51).
- 6** Replace the front bezel (see "Replacing the Front Bezel" on page 29).
- 7** Replace the computer cover (see "Replacing the Computer Cover" on page 18).
- 8** Connect your computer and devices to electrical outlets and turn them on.

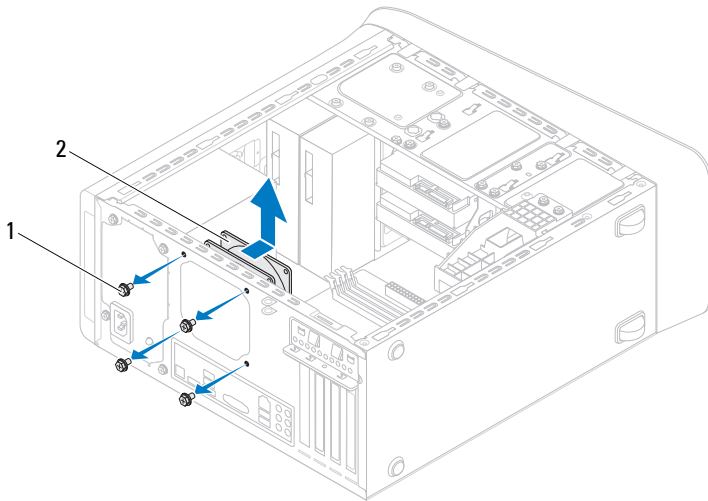
Fans

-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.
-  **WARNING:** To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.
-  **WARNING:** Do not operate your computer with any cover(s) (including computer covers, bezels, filler brackets, front-panel inserts, etc.) removed.
-  **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.

Chassis Fan

Removing the Chassis Fan

-  **CAUTION:** Do not touch the fan blades when you are removing the chassis fan, as this could damage the fan.
- 1 Follow the instructions in "Before You Begin" on page 13.
 - 2 Remove the computer cover (see "Removing the Computer Cover" on page 17).
 - 3 Disconnect the chassis fan cable from the system board connector SYS_FAN1 (see "System Board Components" on page 10).
 - 4 Remove the four screws that secure the chassis fan to the chassis.
 - 5 Slide and lift the chassis fan away from the computer as shown in the illustration.




1 screws (4)

2 chassis fan

Replacing the Chassis Fan

- 1 Follow the instructions in "Before You Begin" on page 13.
- 2 Align the screw holes on the chassis fan with the screw holes on the chassis.
- 3 Replace the four screws that secure the chassis fan to the chassis.
- 4 Connect the chassis fan cable to the system board connector SYS_FAN1 (see "System Board Components" on page 10).
- 5 Replace the computer cover (see "Replacing the Computer Cover" on page 18).

Processor Fan and Heat-Sink Assembly

 **WARNING:** Despite having a plastic shield, the processor fan and heat-sink assembly may be very hot during normal operation. Ensure that it has had sufficient time to cool before you touch it.

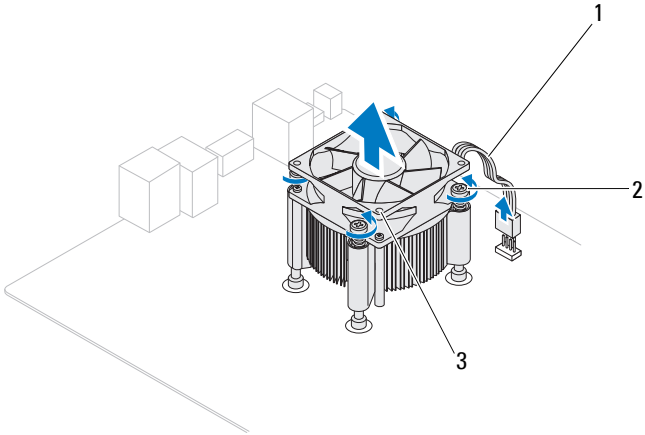
 **CAUTION:** The processor fan and heat-sink assembly is a single unit. Do not try to remove the fan separately.

Removing the Processor Fan and Heat-Sink Assembly

- 1 Follow the instructions in "Before You Begin" on page 13.
- 2 Remove the computer cover (see "Removing the Computer Cover" on page 17).
- 3 Disconnect the processor fan cable from the system board connector, CPU_FAN (see "System Board Components" on page 10).
- 4 Using a flat-blade screwdriver loosen the four captive screws that secure the processor fan and heat-sink assembly to the system board.

 **CAUTION:** When you remove the processor fan and heat-sink assembly, lay it upside down or on its side to avoid damaging the heat-sink thermal interface.

- 5 Lift the processor fan and heat-sink assembly out of the computer.



- 1 processor fan cable
- 3 processor fan and heat-sink assembly

- 2 captive screws (4)

Replacing the Processor Fan and Heat-Sink Assembly

- 1 Follow the instructions in "Before You Begin" on page 13
- 2 Clean the thermal grease from the bottom of the heat-sink.



CAUTION: Ensure that you apply new thermal grease. New thermal grease is critical for ensuring adequate thermal bonding, which is a requirement for optimal processor operation.






- 3 Apply new thermal grease to the top of the processor.
- 4 Place the processor fan and heat-sink assembly over the processor.
- 5 Align the four captive screws on the processor fan and heat-sink assembly with the screw holes on the system board.
- 6 Tighten the four captive screws that secure the processor fan and heat-sink assembly to the system board.





NOTE: Ensure that the processor fan and heat-sink assembly is correctly seated and secure.

- 7 Connect the processor fan cable to the system board connector, CPU_FAN (see "System Board Components" on page 10).
- 8 Replace the computer cover (see "Replacing the Computer Cover" on page 18).
- 9 Connect your computer and devices to electrical outlets, and turn them on.

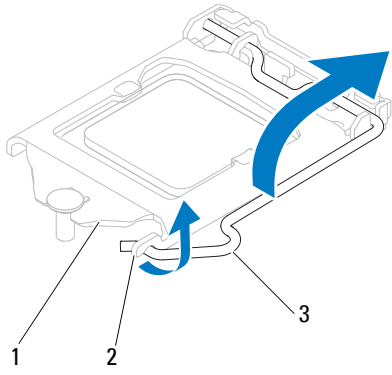
Processor

-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.
-  **WARNING:** To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.
-  **WARNING:** Do not operate your equipment with any cover(s) (including computer covers, bezels, filler brackets, front-panel inserts, etc.) removed.
-  **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.
-  **CAUTION:** Do not perform the following steps unless you are familiar with hardware removal and replacement. Performing these steps incorrectly could damage your system board. For technical service information, see the *Setup Guide*.

Removing the Processor

- 1 Follow the procedures in "Before You Begin" on page 13.
 - 2 Remove the computer cover (see "Removing the Computer Cover" on page 17).
-  **CAUTION:** Despite having a plastic shield, the heat-sink assembly may be very hot during normal operation. Ensure that it has had sufficient time to cool before you touch it.
- 3 Remove the processor fan and heat-sink assembly from the computer (see "Removing the Processor Fan and Heat-Sink Assembly" on page 79).
-  **NOTE:** Unless a new heat-sink is required for the new processor, reuse the original heat-sink assembly when you replace the processor.

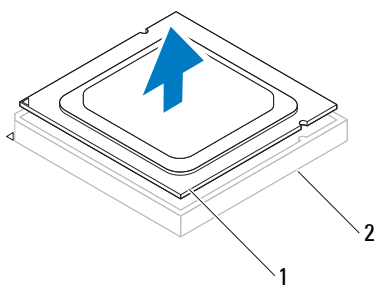
- 4 Press the release lever down and then pull it outwards to release it from the tab that secures it.
- 5 Extend the release lever completely to open the processor cover.



1 processor cover 2 tab 3 release lever

⚠ CAUTION: When removing the processor, do not touch any of the pins inside the socket or allow any objects to fall on the pins in the socket.

- 6 Gently lift the processor to remove it from the socket.
Leave the release lever extended in the release position so that the socket is ready for the new processor.



Replacing the Processor

△ **CAUTION:** Ground yourself by touching an unpainted metal surface on the back of the computer.

△ **CAUTION:** When replacing the processor, do not touch any of the pins inside the socket or allow any objects to fall on the pins in the socket.

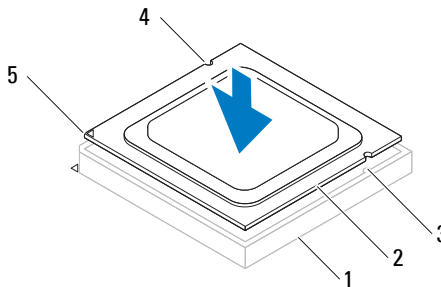
- 1 Follow the procedures in "Before You Begin" on page 13.
- 2 Unpack the new processor, being careful not to touch the underside of the processor.

△ **CAUTION:** You must position the processor correctly in the socket to avoid permanent damage to the processor and the computer when you turn on the computer.

- 3 If the release lever on the socket is not fully extended, move it to that position.
- 4 Orient the alignment notches on the processor with the alignment tabs on the socket.
- 5 Align the pin-1 corners of the processor and socket.

△ **CAUTION:** To avoid damage, ensure that the processor aligns properly with the socket, and do not use excessive force when you install the processor.

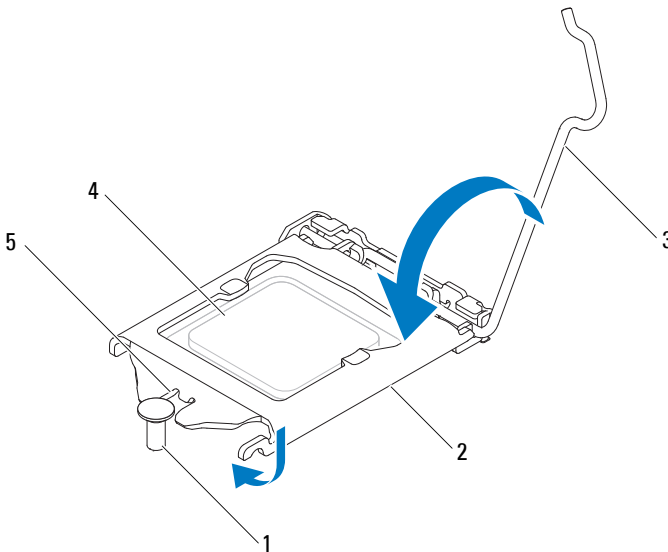
Set the processor lightly in the socket and ensure that the processor is positioned correctly.



- | | | | | | |
|---|-----------------------|---|---------------------------|---|--------------------|
| 1 | socket | 2 | processor | 3 | alignment tabs (2) |
| 4 | alignment notches (2) | 5 | processor pin-1 indicator | | |

△ CAUTION: Ensure that the processor cover notch is positioned underneath the alignment post.

- 6 When the processor is fully seated in the socket, close the processor cover.
- 7 Pivot the release lever down and place it under the tab on the processor cover.



- | | | | | | |
|---|----------------|---|-----------------------|---|---------------|
| 1 | alignment post | 2 | processor cover | 3 | release lever |
| 4 | processor | 5 | processor cover notch | | |

- 8 Clean the thermal grease from the bottom of the heat-sink.

 **CAUTION: Ensure that you apply new thermal grease. New thermal grease is critical for ensuring adequate thermal bonding, which is a requirement for optimal processor operation.**

9 Apply the new thermal grease to the top of the processor.






10 Replace the processor fan and heat-sink assembly (see "Replacing the Processor Fan and Heat-Sink Assembly" on page 81).

 **CAUTION: Ensure that the processor fan and heat-sink assembly is correctly seated and secure.**


11 Replace the computer cover (see "Replacing the Computer Cover" on page 18).

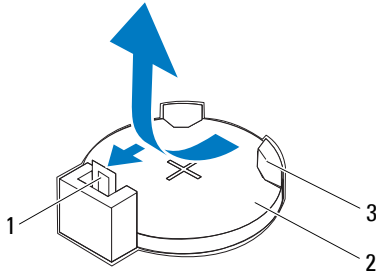
12 Connect your computer and devices to electrical outlets, and turn them on.

Coin-Cell Battery

-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.
-  **WARNING:** A new battery can explode if it is incorrectly installed. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.
-  **WARNING:** To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.
-  **WARNING:** Do not operate your computer with any cover(s) (including computer covers, bezels, filler brackets, front-panel inserts, etc.) removed.
-  **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.

Removing the Coin-Cell Battery

- 1 Record all the screens in system setup (see "System Setup Utility" on page 103) so that you can restore the correct settings after the new coin-cell battery has been installed.
 - 2 Follow the instructions in "Before You Begin" on page 13.
 - 3 Remove the computer cover (see "Removing the Computer Cover" on page 17).
 - 4 Locate the battery socket on the system board (see "System Board Components" on page 10).
-  **CAUTION:** If you pry the battery out of its socket with a blunt object, be careful not to touch the system board with the object. Ensure that the object is inserted between the battery and the socket before you attempt to pry out the battery. Otherwise, you may damage the system board by prying off the socket or by breaking circuit traces on the system board.
- 5 Press the battery-release lever to remove the coin-cell battery.

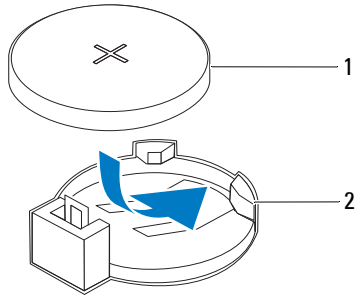


- 1 battery-release lever 2 coin-cell battery
3 battery socket

6 Set aside the battery in a secure location.

Replacing the Coin-Cell Battery

- 1** Follow the instructions in "Before You Begin" on page 13
- 2** Insert the new coin-cell battery (CR2032) into the socket with the side labeled "+" facing up, and press the coin-cell battery into place.







1 coin-cell battery

2 battery socket

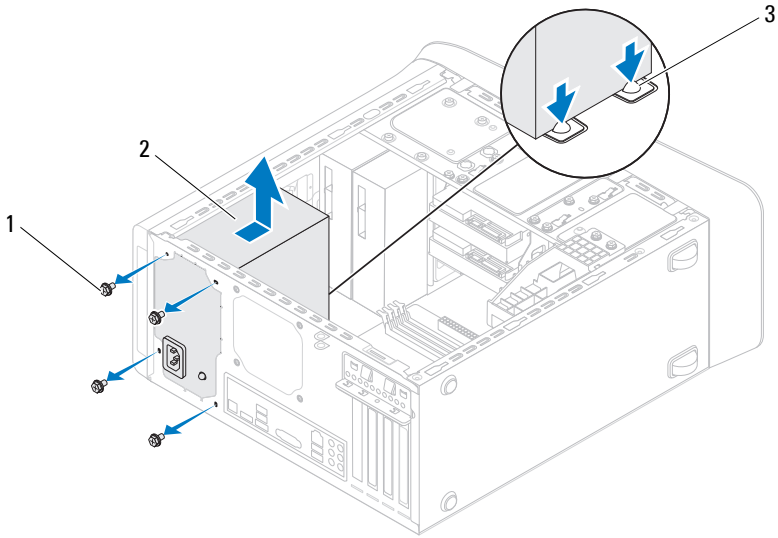
- 3** Replace the computer cover (see "Replacing the Computer Cover" on page 18).
- 4** Connect your computer and devices to electrical outlets, and then turn them on.
- 5** Enter system setup (see "System Setup Utility" on page 103) and restore the settings you recorded in step 1.

Power Supply

-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.
-  **WARNING:** To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.
-  **WARNING:** Do not operate your computer with any cover(s) (including computer covers, bezels, filler brackets, front-panel inserts, etc.) removed.
-  **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.

Removing the Power Supply

- 1 Follow the instructions in "Before You Begin" on page 13.
- 2 Remove the computer cover (see "Removing the Computer Cover" on page 17).
- 3 Disconnect the DC power cables from the system board and the drives (see "System Board Components" on page 10).
- 4 Remove the four screws that secure the power supply to the chassis.
- 5 Press the power supply clamps to release the power supply from the chassis.
- 6 Slide and lift the power supply away from the chassis.



1 screws (4)

2 power supply

3 power supply clamps (2)

Replacing the Power Supply





- 1 Follow the instructions in "Before You Begin" on page 13.
- 2 Slide the power supply towards the back of the chassis.
- 3 Align the screw holes on the power supply with the screw holes on the chassis.



WARNING: Failure to replace and tighten all screws may cause electrical shock as these screws are a key part of the system grounding.

- 4 Replace the four screws that secure the power supply to the chassis.
- 5 Connect the DC power cables to the system board and drives (see "System Board Components" on page 10).
- 6 Replace the computer cover (see "Replacing the Computer Cover" on page 18).
- 7 Connect your computer and devices to electrical outlets, and turn them on.

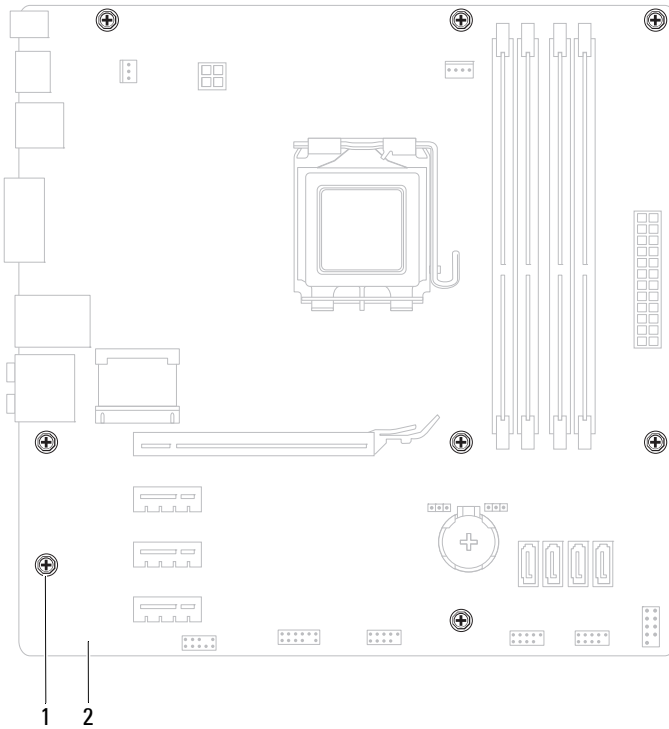
System Board

-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.
-  **WARNING:** To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.
-  **WARNING:** Do not operate your computer with any cover(s) (including computer covers, bezels, filler brackets, front-panel inserts, etc.) removed.
-  **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.

Removing the System Board

- 1 Follow the instructions in "Before You Begin" on page 13.
- 2 Remove the computer cover (see "Removing the Computer Cover" on page 17).
- 3 Remove the Mini-Card, if applicable (see "Removing the Mini-Card" on page 33).
- 4 Remove any PCI Express cards, if applicable (see "Removing PCI Express Cards" on page 39).
- 5 Remove the processor fan and heat-sink assembly (see "Removing the Processor Fan and Heat-Sink Assembly" on page 79).
- 6 Remove the processor (see "Removing the Processor" on page 83).
- 7 Remove the memory modules (see "Removing the Memory Module(s)" on page 21) and record which memory module is removed from each DIMM slot so that the memory modules can be installed in the same slot after the system board is replaced.


- 8 Disconnect all cables connected to the system board (see "System Board Components" on page 10). Note the routing of all cables as you remove them so that you can re-route them correctly after installing the new system board.
- 9 Remove the eight screws that secure the system board to the chassis.




1 screws (8)

2 system board


- 10 Lift the system board up and out of the chassis.
- 11 Compare the system board that you removed with the replacement system board to ensure that they are identical.

 **NOTE:** Some components and connectors on the replacement system board may be in different locations compared to the components and connectors on the existing system board.

 **NOTE:** Jumper settings on the replacement system board is preset at the factory.

Replacing the System Board

- 1 Follow the instructions in "Before You Begin" on page 13.
- 2 Gently place the system board into the chassis and slide it towards the back of the computer.
- 3 Replace the eight screws that secure the system board to the chassis.
- 4 Connect the cables that you disconnected from the system board (see "System Board Components" on page 10).
- 5 Replace the processor (see "Replacing the Processor" on page 85).
- 6 Replace the processor fan and the heat-sink assembly (see "Replacing the Processor Fan and Heat-Sink Assembly" on page 81).

 **CAUTION: Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.**

 **CAUTION: Ensure that the heat-sink assembly is correctly seated and secure.**

- 7 Replace the memory modules (see "Replacing the Memory Module(s)" on page 22).
- 8 Replace any PCI Express cards, if applicable (see "Replacing PCI Express Cards" on page 41).
- 9 Replace the Mini-Card, if applicable (see "Replacing the Mini-Card" on page 34).
- 10 Replace the computer cover (see "Replacing the Computer Cover" on page 18).
- 11 Connect your computer and devices to electrical outlets and turn them on.

12 Flash the system BIOS, as needed.



NOTE: For information on flashing the system BIOS, see "Flashing the BIOS" on page 115.

Entering the Service Tag in the BIOS

- 1 Turn on the computer.
- 2 Press <F2> during POST to enter the system setup program.
- 3 From the main tab enter the service tag in the Set Service Tag field.



NOTE: Set Service Tag field allows you to enter the service tag manually only when the service tag is absent.

System Setup Utility

Overview

Use the system setup utility to:

- Change the system configuration information after you add, change, or remove any hardware in your computer
- Set or change a user-selectable option such as the user password
- Read the current amount of memory or set the type of hard drive installed



CAUTION: Unless you are an expert computer user, do not change the settings for this program. Certain changes can make your computer work incorrectly.



NOTE: Before you change system setup, it is recommended that you write down the system setup screen information for future reference.

Entering System Setup Utility

- 1 Turn on (or restart) your computer.
- 2 When the DELL logo is displayed, watch for the F2 prompt to appear and then press <F2> immediately.




NOTE: The F2 prompt indicates that the keyboard has initialized. This prompt can appear very quickly, so you must watch for it, and then press <F2>. If you press <F2> before the F2 prompt, this keystroke will be lost. If you wait too long and the operating system logo appears, continue to wait until you see the Microsoft Windows desktop. Then, shut down your computer (see "Turning Off Your Computer" on page 13) and try again.

System Setup Screens

The system setup screen displays current or changeable configuration information for your computer. Information on the screen is divided into three areas: the **setup item**, active **help screen**, and **key functions**.

<p>Setup Item — This field appears on the left side of the system setup window. The field is a scrollable list containing features that define the configuration of your computer, including installed hardware, power conservation, and security features.</p> <p>Scroll up and down the list with the up- and down-arrow keys. As an option is highlighted, the Help Screen displays more information about that option and available settings.</p>	<p>Help Screen — This field appears on the right side of the system setup window and contains information about each option listed in the Setup Item. In this field you can view information about your computer and make changes to your current settings.</p> <p>Press the up-arrow and down-arrow keys to highlight an option. Press <Enter> to make that selection active and return to the Setup Item.</p> <p>NOTE: Not all settings listed in the Setup Item are changeable.</p>
<p>Key Functions — This field appears below the Help Screen and lists keys and their functions within the active system setup field.</p>	

System Setup Options

 **NOTE:** Depending on your computer and installed devices, the items listed in this section may appear, or may not appear exactly as listed.

Main	
System Information	Displays the system name
BIOS Version	Displays the BIOS version number
System Date	Displays the current date in mm/dd/yyyy format
System Time	Displays the current time in hh:mm:ss format
Service Tag	Displays the service tag of the computer when the service tag is present
	Displays a field to input the service tag manually when the service tag is absent

Asset Tag	Displays the asset tag of the computer when the asset tag is present
Processor Information	
Processor Type	Displays the processor information
L2 Cache	Displays the L2 cache size
L3 Cache	Displays the L3 cache size
Memory Information	
Memory Installed	Indicates the amount of memory installed in MB
Memory Speed	Indicates the memory speed in MHz
Memory Technology	Indicates the type of installed memory
Memory Channel	Indicates single channel or dual channel mode
Device Information	
SATA 0	Displays the SATA drive connected to the SATA 0 connector
SATA 1	Displays the SATA drive connected to the SATA 1 connector
SATA 2	Displays the SATA drive connected to the SATA 2 connector
SATA 3	Displays the SATA drive connected to the SATA 3 connector
ESATA	Displays the ESATA drive connected to the computer

Advanced

CPU Configuration

- Hyper-threading — Enabled or Disabled (Enabled by default)
- Active Processor Cores — All; 1; 2; 3 (All by default)
- Limit CPUID Value — Enabled or Disabled (Disabled by default)
- CPU XD Support — Enabled or Disabled (Enabled by default)
- Intel Virtualization Technology — Enabled or Disabled (Enabled by default)
- Intel SpeedStep — Enabled or Disabled (Enabled by default)
- Intel Turbo Boost Technology — Enabled or Disabled (Enabled by default)
- CPU C6 Report — Enabled or Disabled (Enabled by default)

Graphics Configuration

- Intel Multiple Monitor Feature — Enabled or Disabled (Disabled by default)

System Configuration

- Onboard Audio Controller — Enabled or Disabled (Enabled by default)
- Onboard LAN Controller — Enabled or Disabled (Enabled by default)
- Onboard LAN Boot ROM — Enabled or Disabled (Disabled by default)
- SATA Mode — AHCI; RAID (AHCI by default)
- ESATA Port — Enabled or Disabled (Enabled by default)
- USB Controller — Enabled or Disabled (Enabled by default)
- Onboard Card Reader — Enabled or Disabled (Enabled by default)

Power Management

- Restore AC Power Loss — Power Off; Power On; Last State (Power Off by default)
- Wake on LAN from S4/S5 — Enabled or Disabled (Enabled by default)
- USB Powershare in S4/S5 State — Enabled or Disabled (Disabled by default)
- USB Powershare in Sleep State — Normal; Enhanced (Normal by default)
- Resume by PS/2 Devices — Enabled or Disabled (Enabled by default)
- Auto Power On — Enabled or Disabled (Disabled by default)
- Auto Power On Date — 0 to 31, 0 for everyday (15 by default)
- Auto Power On Hour — 0 to 23 (12 by default)
- Auto Power On Minute — 0 to 59 (30 by default)
- Auto Power On Second — 0 to 59 (30 by default)
- Bootup NumLock State — On; Off (On by default)
- Keyboard Error Report — Enabled; Disabled (Enabled by default)

Post Behavior

Security

Admin Password

Allows to set, change, or delete the administrator password

NOTE: Deleting the administrator password will delete the system password. Hence, the administrator password must be set before setting the system password.

System Password

Allows to set, change, or delete the system password

Boot Menu Security	Enabled or Disabled User must enter Admin Password to access the F12 Boot Menu when this setting is enabled (Disabled by default)
--------------------	--

Boot

1st Boot Priority	Specifies the boot sequence from the available devices Hard Disk; CD/DVD; Network; USB Floppy; USB Hard Disk; USB CD/DVD; Disabled (Hard Disk by default)
2nd Boot Priority	Specifies the boot sequence from the available devices Hard Disk; CD/DVD; Network; USB Floppy; USB Hard Disk; USB CD/DVD; Disabled (CD/DVD Drive by default)
3rd Boot Priority	Specifies the boot sequence from the available devices Hard Disk; CD/DVD; Network; USB Floppy; USB Hard Disk; USB CD/DVD; Disabled (USB Floppy by default)
4th Boot Priority	Specifies the boot sequence from the available devices Hard Disk; CD/DVD; Network; USB Floppy; USB Hard Disk; USB CD/DVD; Disabled (Network by default)
5th Boot Priority	Specifies the boot sequence from the available devices Hard Disk; CD/DVD; Network; USB Floppy; USB Hard Disk; USB CD/DVD; Disabled (USB Hard Disk by default)
6th Boot Priority	Hard Disk; CD/DVD; Network; USB Floppy; USB Hard Disk; USB CD/DVD; Disabled (USB CD/DVD by default)

Exit

Boot Sequence

This feature allows you to change the boot sequence for devices.

Boot Options

- **USB Floppy** — The computer attempts to boot from the USB floppy disk drive. If no operating system is on the floppy disk, the computer generates an error message.
- **Hard Drive** — The computer attempts to boot from the primary hard drive. If no operating system is on the drive, the computer generates an error message.
- **CD/DVD/CD-RW Drive** — The computer attempts to boot from the CD/DVD/CD-RW drive. If no CD/DVD/CD-RW is in the drive, or if the CD/DVD/CD-RW has no operating system, the computer generates an error message.
- **USB Storage Device** — Insert the memory device into a USB connector and restart the computer. When **F12 Boot Options** appears in the lower-right corner of the screen, press <F12>. The BIOS detects the device and adds the USB flash option to the boot menu.



NOTE: To boot to a USB device, the device must be bootable. To ensure that your device is bootable, check the device documentation.

- **Network** — The computer attempts to boot from the network. If no operating system is found on the network, the computer generates an error message.



NOTE: To boot from the network, ensure that onboard LAN boot ROM option is enabled in the system setup (see "System Setup Utility" on page 103).

Changing Boot Sequence for the Current Boot

You can use this feature to change the current boot sequence, for example, to boot from the CD/DVD/CD-RW drive to run the Dell Diagnostics from the *Drivers and Utilities* disc. On completion of diagnostic tests, the previous boot sequence is restored.

- 1 If you are booting from a USB device, connect the USB device to a USB connector.
- 2 Turn on (or restart) your computer.
- 3 When **F2 Setup**, **F12 Boot Options** appears in the lower-right corner of the screen, press <F12>.



NOTE: If you wait too long and the operating system logo appears, continue to wait until you see the Microsoft Windows desktop. Then shut down your computer and try again.

The **Boot Device Menu** appears, listing all available boot devices.

- 4 On the **Boot Device Menu** choose the device you want to boot from. For example, if you are booting to a USB memory key, highlight **USB Storage Device** and press <Enter>.



NOTE: To boot to a USB device, the device must be bootable. To ensure your device is bootable, check the device documentation.

Changing Boot Sequence for Future Boots

- 1 Enter system setup utility (see "Entering System Setup Utility" on page 103).
- 2 Use the arrow keys to highlight the **Boot** menu option and press <Enter> to access the menu.



NOTE: Write down your current boot sequence in case you want to restore it.

- 3 Press the up- and down-arrow keys to move through the list of devices.
- 4 Press plus (+) or minus (-) to change the boot priority of the device.

Clearing Forgotten Passwords



WARNING: Before you begin any of the procedures in this section, follow the safety instructions that shipped with your computer.



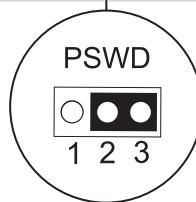
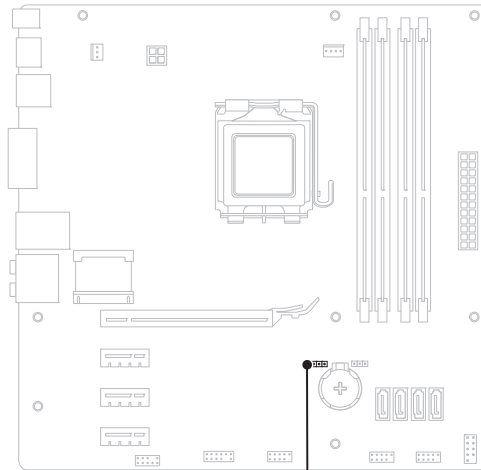
WARNING: The computer must be disconnected from the electrical outlet to clear the password setting.



CAUTION: Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.

⚠ CAUTION: To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on your computer).

- 1 Follow the instructions in "Before You Begin" on page 13.
- 2 Remove the computer cover (see "Removing the Computer Cover" on page 17).
- 3 Locate the 3-pin password reset jumper (PSWD) on the system board. (see "System Board Components" on page 10).
- 4 Remove the 2-pin jumper plug from pins 2 and 3 and fix it on pins 1 and 2.



- 5 Turn on the computer to clear the password.
- 6 Turn off the computer and disconnect your computer and all attached devices from their electrical outlets.
- 7 Remove the 2-pin jumper plug from pins 1 and 2 and replace it on pins 2 and 3 to enable the password feature.
- 8 Replace the computer cover (see "Replacing the Computer Cover" on page 18).
- 9 Connect your computer and devices to electrical outlets and turn them on.

Clearing CMOS Passwords



WARNING: Before you begin any of the procedures in this section, follow the safety instructions that shipped with your computer.



WARNING: The computer must be disconnected from the electrical outlet to clear the password setting.

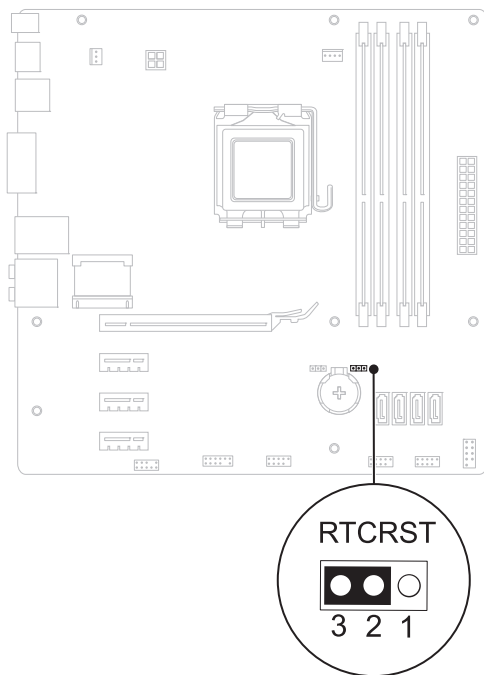


CAUTION: Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.



CAUTION: To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on your computer).

- 1 Follow the instructions in "Before You Begin" on page 13.
- 2 Remove the computer cover (see "Removing the Computer Cover" on page 17).
- 3 Locate the 3-pin CMOS reset jumper (RTCST) on the system board (see "System Board Components" on page 10).
- 4 Remove the 2-pin jumper plug from pins 2 and 3 and fix it on pins 1 and 2.



- 5** Wait for approximately five seconds to clear the CMOS setting.
- 6** Remove the 2-pin jumper plug from pins 1 and 2 and replace it on pins 2 and 3.
- 7** Replace the computer cover (see "Replacing the Computer Cover" on page 18).
- 8** Connect your computer and devices to electrical outlets and turn them on.

Flashing the BIOS

The BIOS may require flashing when an update is available or when replacing the system board. To flash the BIOS:

- 1 Turn on the computer.
- 2 Go to support.dell.com/support/downloads.
- 3 Locate the BIOS update file for your computer.



NOTE: The Service Tag for your computer is located on a label on the top of your computer.

If you have your computer's Service Tag:

- a Click **Enter a Tag**.
- b Enter your computer's Service Tag in the **Enter a service tag** field, click **Go**, and proceed to step 4.

If you do not have your computer's Service Tag:

- a Select the type of product in the **Select Your Product Family** list.
- b Select the product brand in the **Select Your Product Line** list.
- c Select the product model number in the **Select Your Product Model** list.



NOTE: If you have selected a different model and want to start over again, click **Start Over** on the top right of the menu.

- d Click **Confirm**.
- 4 A list of results appear on the screen. Click **BIOS**.
- 5 Click **Download Now** to download the latest BIOS file. The **File Download** window appears.
- 6 Click **Save** to save the file on your desktop. The file downloads to your desktop.
- 7 Click **Close** if the **Download Complete** window appears. The file icon appears on your desktop and is titled the same as the downloaded BIOS update file.

- 8 Double-click the file icon on the desktop and follow the instructions that appear on the screen.